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KEYS TO PROFITABLE RABBITEYE BLUEBERRY PRODUCTION IN TEXAS

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Introduction

Rabbiteye blueberries (*Vaccinium ashei* Reade) are becoming an important commercial crop in Texas. Plantings are directed toward the U-pick market with limited hand harvesting for local retail outlets. As the industry grows, expanded production requires shipping to more distant markets and an organized marketing effort to insure continued profitability.

Currently, blueberries have no serious insect or disease problems and are well suited to the East Texas environment. Blueberry production is limited to those sections of Texas with acid, sandy soils.

Site Selection

Site selection is the most important step in establishing a successful blueberry planting. Major factors to consider include soil type, soil pH, water drainage, air movement and irrigation water quality.

Soil type. A blueberry plant's root system is shallow and fibrous and lacks root hairs. Blueberry roots do not penetrate tight, clay soils easily and require a loose, friable soil environment for development of an extensive root system. A sandy topsoil should be at least 18 to 24 inches deep. Deeper topsoils are preferable to allow more extensive root penetration. Organic matter in the soil helps to improve soil characteristics such as soil structure, moisture retention and nutrient availability. However, most sandy Texas soils have a low organic matter content and need peat moss for successful blueberry growth.

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Soil pH. Acid soils are well suited to blueberry production unless lime has been applied recently. Blueberries require a soil pH between 4.5 and 5.5 and will not perform well under more acid or more alkaline conditions. Make adjustments if soil pH does not fall into the optimum range. Rarely does pH need to be raised in East Texas soils, but under extreme acid conditions (less than pH 4.0), pH can be increased using lime. Make soil pH adjustments 6 months to 1 year before planting, based on a soil test analysis. Consult your local county Extension agent for assistance. After planting, monitor soil pH every 2 years.

Water quality. The quality of irrigation water is judged by the total amount of salts, the proportion of sodium and the level of biocarbonates. Excess salts limit the ability of roots to take up water and cause direct toxic effects.

It is mandatory to have a water quality analysis done on any water proposed for irrigating blueberries. Do not plant blueberries where water quality is unsuitable. The Cooperative Extension Service Soil Testing Laboratory at College Station analyzes water samples for irrigation quality. Local county Extension agents can explain the sampling process and provide necessary information forms.

Water drainage. Blueberries cannot tolerate wet soil conditions. Water tables should not be within 2 feet of the soil surface. Plants must not stand in water for extended periods (1 week) during any part of the year. Sandy soils generally provide good water drainage and soil aeration unless located in a low lying area. Upland soils are preferred but lower areas can be used if water and air drainage are adequate.

Air drainage. Blueberries normally bloom in mid-March in East Texas and late spring frosts have not been a problem. In only 1 of 10 years has frost

damage occurred to blueberries at Overton, and yields were not greatly affected. However, avoid low lying sites which accumulate colder air (frost pockets) or areas surrounded by trees or other obstacles to air movement.

Establishing the Planting

Preplant preparation. Initiate weed control the year (spring or summer) before establishing the planting. Place emphasis on eradicating perennial weeds such as bermudagrass. A contact herbicide such as Roundup® can be used successfully. Follow label instructions for effective control.

After perennial weeds are under control, the site can be seeded to a cover crop such as Elbon Rye in the fall for later incorporation into the soil. The cover crop helps control weeds during the preplant year and adds organic matter to the soil. Deeply plow the planting site and subsoil shortly before establishing the planting.

Selecting varieties. Blueberries require cross-pollination with at least two varieties needed. Cross pollination is achieved by alternating varieties between rows. Place two or three beehives per acre in the orchard at first bloom to insure adequate pollination.

Table 1 lists recommended varieties for Texas, approximate berry size and average harvest dates.

Table 1. Recommended varieties of rabbiteye blueberries.

Variety	Berry size berries/pint	Average harvest date
Climax	325	June 10 - June 26
Briteblue	375	June 20 - July 15
Delite	210	June 30 - July 20
Tifblue	273	June 30 - July 20
Britewell (Promising)	375	June 22 - July 15

Yields in mature orchards (8 to 10 years old) may reach 10,000 to 12,000 pounds per acre.

Planting. Space rabbiteye blueberries 6 feet apart within the row and 12 feet between rows. Make the planting hole approximately 18 inches across and 18 inches deep. Add organic matter to the soil area to be occupied by the first year's root growth. Mix approximately 1/2 bushel of peat moss with the soil from each planting hole. Thoroughly wet the peat soil mix before planting the bush, either through irrigation or rainfall. Do not apply fertilizer when planting.

Blueberry plants can be purchased barerooted or in containers. Generally survival of container plants has proved superior. Prune bareroot plants to a height of 6 to 12 inches when planted in the orchard. Container plants do not require extensive pruning. Thoroughly loosen the rootball on container plants and spread at planting. Plant blueberries at the same depth as they were grown in the nursery.

Irrigation

Irrigation and quality of water used on rabbiteye blueberries is of paramount importance. Blueberry production in Texas is not recommended unless adequate irrigation is used. Research conducted by the Texas Agricultural Research and Extension Center at Overton shows that irrigation increases plant survivability, growth rate, yields and berry quality.

The average annual rainfall in East Texas is normally sufficient to support blueberry production. Because of the rainfall distribution pattern, however, extreme shortages occur in summer. Design the irrigation system to meet daily requirements of a mature orchard during the highest water demand periods. During the July-August period, the orchard requires approximately 9,000 gallons per acre daily. Design irrigation ponds to supply 6 acre-feet of water per year for each acre of blueberries.

Three commonly used irrigation systems are drip, micro-sprinklers and sprinklers. Each system has specific advantages. Consult irrigation suppliers for cost and suitability to your operation.

Water sources. Sources used consist of wells, lakes, streams and community water supplies. The water quality varies with sources and even within a particular source, i.e., the deeper into the Wilcox aquifer, the poorer the water quality for irrigation.

There are also legal aspects to consider before determining the water source. Most above-ground water, lakes and streams belong to the state and an irrigation permit is required. Above-ground water in East Texas is usually ideal for blueberries because of its lower pH and high quality. Regardless of the source, water tests are recommended to determine the quality of each source available. For information concerning irrigation permits, write the Texas Department of Water Resources, P.O. Box 13087, Austin, Texas 78711.

Water requirements. The most common problem in commercial blueberry planting is insufficient water application. Continuous irrigation during the year is not normally required. However, blueberry plants require adequate soil moisture throughout the year. Rainfall influences the amount of water required, i.e., if it rains 1 inch today, no irrigation may be needed for 4 to 7 days, depending on the time of year. Irrigation is also influenced by size of plant and growth stage, temperature, relative humidity and wind velocity. The following table shows the blueberries' daily water requirement per plant.

Table 2. Irrigation water requirements for rabbiteye blueberries in East Texas.

Month	Requirement (gal per day per plant) based on years in orchard			
	First yr	Second yr	Third yr	Fourth & subsequent yr
Jan.	1	1	2	4
Feb.*	1	1	2	4
March	1	1	2	6
April	1	1	4	8
May	1	1	4	14
June	2	2	8	16
July	2	4	8	17
Aug.	2	4	8	17
Sept.	1	2	6	13
Oct.	1	1	4	10
Nov.*	1	1	2	7
Dec.	1	1	2	5

*Normally during November through February, irrigation is not required except under abnormally dry conditions.

The ideal system replaces the amount of water the plant used the previous day, so that uniform soil moisture is maintained. Use of soil moisture monitoring devices also aids the grower in determining when to irrigate. Soil irrometers properly maintained are useful tools in scheduling blueberry irrigation.

Fertilization. Blueberries are sensitive to overfertilization. Use care regarding amount and type of fertilizer applied and application method. Uniformly distribute fertilizers around the plant and *do not place* in a concentrated area at the base of the plant.

Avoid nitrate forms of nitrogen as they are detrimental to blueberry growth. In home plantings, blueberries can be fertilized with azalea food.

Nitrogen is the most limiting nutrient in East Texas soils. Ammonium sulfate (21-0-0) is an acceptable nitrogen form to use where soil pH is 5.0 or greater; if below 5.0, use a urea nitrogen source. Phosphorus and potassium are normally needed in smaller quantities than nitrogen. Based upon preliminary data, the following fertilization schedule has been proposed, and 12-12-12 or 15-5-10 provides some nitrogen and all of the phosphorus and potassium, with ammonium sulfate or urea used to provide the additional nitrogen required. See table 3.

Table 3. Fertilizer recommended for Texas rabbiteye blueberries (ounces per plant).

	15-5-10 alone				OR	12-12-12 + ammonium sulfate*			
	March	April	May	Sept.		March	April	May	Sept.
YEAR 1	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0
2	2.0	2.0	1.0	1.0		2.0	1.0	1.0	1.0
3	2.5	2.5	1.0	1.0		3.0	1.0	1.0	1.0
4	3.0	3.0	2.0	1.5		4.0	2.0	2.0	2.0
5	3.5	3.5	3.0	2.0		5.0	2.0	2.0	2.0

*Below pH 5.0, use urea as nitrogen source. When using urea in place of ammonium sulfate, apply half as much as table rates were applied alone.

Mulching. Mulching conserves moisture, reduces soil temperature and prevents soil crusting. Use sawdust, hay, straw or other suitable organic materials, but they should be weed free. Apply mulch 4 to 6 inches thick and extend to 2 feet on either side of the plant. Depending on type, replace mulch every year or two. Sawdust lasts 1 to 2 years; replace hay every year. On large plantings (1 acre or more), mulching is not cost effective.

Pruning. In a planting established for hand harvesting, limited pruning is required 4 to 6 years after planting. Pruning reduces plant height for ease of picking and thinning out old wood to open the center of the bushes for improved sunlight penetration. Remove suckers arising outside the row area. Pruning for machine harvesting is aimed at keeping the base of the bush narrow for efficient fruit recovery by the harvester. Do pruning immediately after all fruit has been harvested.

Row middles. Maintaining sodded middles (between rows) is preferable as this allows continuous access to the orchard and aids in erosion control. If cultivation is used, make it shallow (no deeper than 2 to 3 inches) to prevent root damage. If the row middles are allowed to sod, frequently mow planting to prevent weed seed distribution.

Herbicides. Control weeds down the row extending 2 feet either side of the plant. Use contact herbicides such as Paraquat® on weeds and grasses which are actively growing. Use care to prevent the

contact herbicide from drifting onto blueberry bushes. Pre-emergent herbicides such as Princep® 80 WP, Sinbar® 80 WP, Surflan®, Karmex® 80 WP or Casoron® 4G have been used in blueberries. However, follow the labels for restrictions and cautions for use on Texas soils.

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